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would have been desirable. On the whole it would have been better if Dr. Speck had not dispersed his energies so much but had treated more carefully one or two topics—for example, the kinship system and hunting territories—for it seems almost impossible to treat the social organization of these tribes in twenty-nine pages.

Of the second Memoir under discussion the first twenty-nine pages are devoted to the myths and folklore of the Timiskaming Algonquin, and the remaining fifty-eight pages to the myths and folklore of the Timagami Ojibwa. They are a substantial contribution to the general folklore of the region, but the collection is too small to solve many problems. Dr. Speck's style is not always lucid and his meaning is not always clear, as, for example, when he speaks of "the men and women in no particular order, forming a large circle, with their leader at their head." However, it is not worth while enumerating slips of this sort, which, as we all know, are very easy to make when writing in haste.

WM. HUBBS-MECHLING

Composition of California Shellmounds. EDWARD WINSLOW GIFFORD. (University of California Publications in American Archaeology and Ethnology, vol. 12, no. 1, February 24, 1916.) 29 pp., map.

At the present time any contribution to archeological method is of appreciable value. Mr. Gifford's suggestive treatment of the California shellmounds by a mechanical analysis has brought forth results bearing directly on the constituents of the mounds, the proportion of these constituents at various depths in the mounds, and inferentially the circumstances of shellmound growth and their age. With a full appreciation of the difficulties that beset such inferences, we have ventured to review those which appear not to have been adequately controlled by a full use of the data.

The data resulting from the mechanical analysis are presented in the first section of this paper. These represent the constituents of the mounds—vertebrate and shell remains, inorganic matter, and the products of combustion—in percentages by weight of the total mound content and percentages of each constituent for each interval of depth. A further analysis of the shell content gives an expression for each mound of the proportions of each molluscan species therein and the percentage composition according to depth for certain species.

The relative proportions of the molluscan species in the total content of the mounds should serve as an index of the environment of the mounds during the period of growth, provided we assume the same ratio of their occurrence at all depths in the mounds. Mr. Gifford's general inference is as follows:—

> No evidence of change of environment is afforded by the results of the analyses. The definite facts established point the other way: that is, toward the continuity throughout shell-mound times of the conditions as they were at the coming of the white man.

Those variations which would invalidate the assumption of uniformity of composition are explained by Mr. Gifford as "nothing but instances of the mound-dwellers' overtaxing the supply of one particular shell species and thus being forced to rely more on other species." This explanation seems to be valid, and its certainty is increased by the fact that some of the inferred variations appear to be far-fetched.

Certain features of the calculation of mound age must be approached with a critical attitude. The formula used in this calculation is as follows:—

$$\frac{\text{Total weight of shell or ash}}{\text{Weight per person per day} \times \text{Population}} = \text{Time of mound growth.}$$

This formula is applied to two mounds, Ellis Landing and Emeryville, evidently chosen because their total volumes were known. In an earlier calculation, based on the volume of the Ellis Landing mound, Nelson, assuming that a constant average of 100 persons consumed 50 shellfish each per day, concluded that the period of mound growth approximated 3,500 years. Substituting this time and population in the formula, Gifford finds that the rate of mound accumulation was 0.56 pounds of shell per person per day and the ash of 83 pounds of wood per family per day. Since the first of these is "reasonable" and the second "moderate" the conclusion is drawn that the assumed age is correct. It seems probable that the shells of 50 shellfish weigh more than 0.56 pound, in which case their assumed equivalence would be disproven. Since the Emeryville mound approximated the Ellis Landing mound in size, a population of the same size was assumed, the unit weights for shell and ash substituted, and its calculated age using shell found as 3,300 years or using ash as 3,700 years. Since the calculated ages of these two mounds chosen at random agreed so closely, the conclusion was drawn that the estimates were corroboratory.

Granting the initial assumptions of population and unit consumption of shell and wood, an obvious objection arises against regarding the estimated ages of these two mounds as in any way corroboratory. It is an accident that the ratios of shell to ash in these mounds are similar. Turning to the whole series we find this ratio varies as follows:—

Sausalito	13 to 1
San Mateo Point	10 to 1
Ellis Landing, Greenbrae and San Mateo	5 to 1
Emeryville and San Francisco	4 to 1
Castro	3 to 1
San Rafael, Carquinez and West Berkeley	2 to 1

It is obvious that the discrepancies in the ages estimated by the shell and ash methods using these other ratios and assuming the same units of consumption would invalidate the method. Again, with similar ratios of shell to ash, mounds of the same volume must of necessity yield the same estimate of age, but vary the volume and the ages are in no way corroboratory. A general statement that where the lower ratios apply "it does not mean merely that the inhabitants burned more than the usual amount of wood; but it undoubtedly means that the mound was built up more slowly than others with a less amount of ash" does not establish the fact, but if true would invalidate the method used above.

In this area where cultural evidence indicates a long and continuous occupation with but little variation in the individual traits, chronological evidence is at a premium and Mr. Gifford's contribution cannot be underestimated. The treatment of each mound separately by these methods is a desideratum.

LESLIE SPIER

ASIA AND OCEANICA

The Oraons of Chota Nagpur: Their History, Economic Life and Social Organization. SARAT CHANDRA ROY, M.A.; with an Introduction by A. C. HADDON, M.A., Sc.D., F.R.S., M.R.I.A. Ranchi, 1915. Pp. XIX, 491. Illustrations and a map.

The Oraon, who are described in this volume, are one of the more northerly of the Dravidian-speaking peoples of India, now occupying a considerable portion of the Chota Nagpur plateau. They have as neighbors the Santal (a Munda tribe) and several other groups of aboriginal peoples of much interest. Closely allied to the Maler (Male, Malto) of the Rajmahal Hills, they formerly lived far to the southward, Grierson placing them definitely in the Carnatic. From this southern home, their migrations were long and apparently somewhat complex, ultimately leading them to their present habitat, whence they drove out